

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
DIPLOMA ENGINEERING – SEMESTER – VI • EXAMINATION – SUMMER 2016

Subject Code: 360503

Date: 11/05/2016

Subject Name: Chemical Engineering Plant Economics

Time: 10:30 AM to 01:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make Suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of programmable & Communication aids are strictly prohibited.
5. Use of only simple calculator is permitted in Mathematics.
6. English version is authentic.

- Q.1** (a) Explain equipment selection procedure. Compare standard equipment with special equipment. **07**
(b) Discuss technical factors considered in plant design. **07**
- Q.2** (a) State the types and importance of flow diagram and explain any one. **07**
(b) Explain the necessity of pilot plant and write the checklist of it. **07**
- OR**
- (b) Discuss the role of chemical engineer and personal experiences in plant design. **07**
- Q.3** (a) Write a short note on “working capital and total capital investment”. **07**
(b) Explain the factors involved in plant layout. **07**
- OR**
- Q.3** (a) Discuss the factors for choice of plant site. **07**
(b) Explain (1) Break-even analysis (2) Continuous Vs Batch process. **07**
- Q.4** (a) Initial value of equipment was Rs. 98000. The salvage value at the end of 10th year is estimated to be Rs. 25000. Determine the value at the end of 5th year using (1) St. line method (2) Declining balance method. **07**
(b) Define : (1) Payout Time (2) Rate of Return on investment (3) Turn Over Ratio (4) Gross & Net Profit. **07**
- OR**
- Q. 4** (a) Classify the depreciation and Explain the methods of determining depreciation. **07**
(b) The purchased cost of filter press with filtering area 150 m² was Rs. 350000 on 1st Jan 2006. Estimate the purchased cost of a similar filter press with filtering area 200 m² on 1st jan 2011. **07**

Data: Marshal & Swift cost index

(1) 1st Jan 2006 - 610

(2) 1st Jan 2011 - 950

Equipment Vs Capacity exponent is 0.67.

Q.5

- (a) Discuss the selection of size reduction equipment in detail. **07**
(b) Describe the general procedure for determining optimum condition with one variable. **07**

OR

Q.5

- (a) State the principles of piping layout. **07**
(b) The following equation shows the effect of variables of x and y on the total cost for a particular operation. **07**

$$C_T = 2.5x + \frac{12000}{xy} + 2y + 10$$

Determine the values of x and y which will give the least total cost.
